

# PNP Epitaxial Silicon Transistor

## KSA992

### Features

- Audio Frequency Low-Noise Amplifier
- Complement to KSC1845
- These are Pb-Free Devices

### MAXIMUM RATINGS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	-120	V
$V_{CEO}$	Collector-Emitter Voltage	-120	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current	-50	mA
$I_B$	Base Current	-10	mA
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	-55 to 150	$^\circ\text{C}$

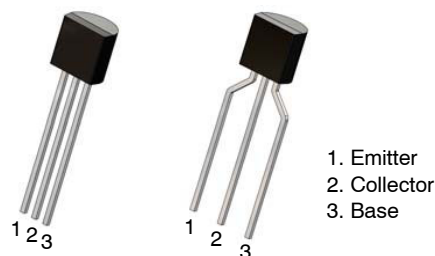
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

(Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.) (Note 1)

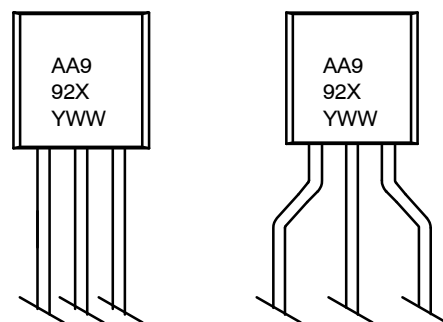
Symbol	Parameter	Value	Unit
$P_D$	Power Dissipation	500	mW
	Derate Above $25^\circ\text{C}$	4	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	250	$^\circ\text{C}/\text{W}$

1. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.



TO-92 3 4.825x4.76 CASE 135AN  
TO-92 3 4.83x4.76 LEADFORMED CASE 135AR

### MARKING DIAGRAMS



A = Assembly Code  
A992 = Device Code  
X = F / FA / FB  
YWW = Date Code

### ORDERING INFORMATION

Device	Package	Shipping
KSA992FBU	TO-92 3 (Pb-Free)	10000 Units / Bulk Bag
KSA992FTA	TO-92 3 LF (Pb-Free)	2000 / Fan-Fold
KSA992FATA	TO-92 3 LF (Pb-Free)	2000 / Fan-Fold
KSA992FBTA	TO-92 3 LF (Pb-Free)	2000 / Fan-Fold

# KSA992

## ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -120\text{ V}, I_E = 0$	–	–	–50	nA
$I_{CEO}$	Collector Cut-Off Current	$V_{CE} = -100\text{ V}, I_B = 0$	–	–	–1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -5\text{ V}, I_C = 0$	–	–	–50	nA
$h_{FE1}$	DC Current Gain	$V_{CE} = -6\text{ V}, I_C = -0.1\text{ mA}$	150	500	–	
$h_{FE2}$		$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	300	450	600	
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	–0.55	–0.61	–0.65	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -10\text{ mA}, I_B = -1\text{ mA}$	–	–0.09	–0.30	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	50	100	–	MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -30\text{ V}, I_E = 0, f = 1\text{ MHz}$	–	2	3	pF
NF	Noise Figure	$V_{CE} = -5\text{ V}, I_C = -1.0\text{ mA},$ $R_S = 100\text{ k}\Omega, f = 1\text{ kHz}$	–	7	–	dB

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

## $h_{FE}$ CLASSIFICATION

Classification	F	FA	FB
$h_{FE2}$	300~600	300~470	430~600

## TYPICAL PERFORMANCE CHARACTERISTICS

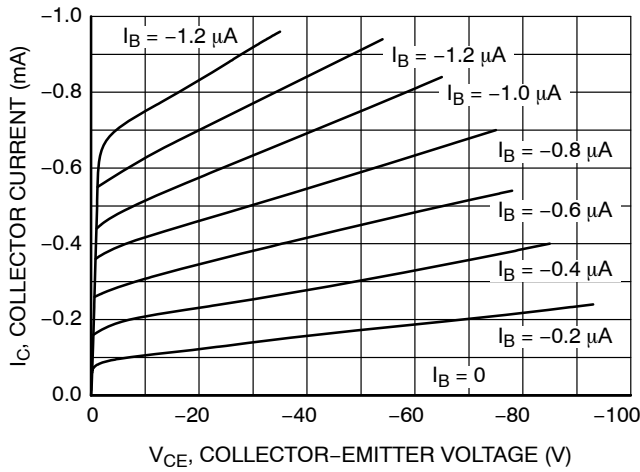


Figure 1. Static Characteristic

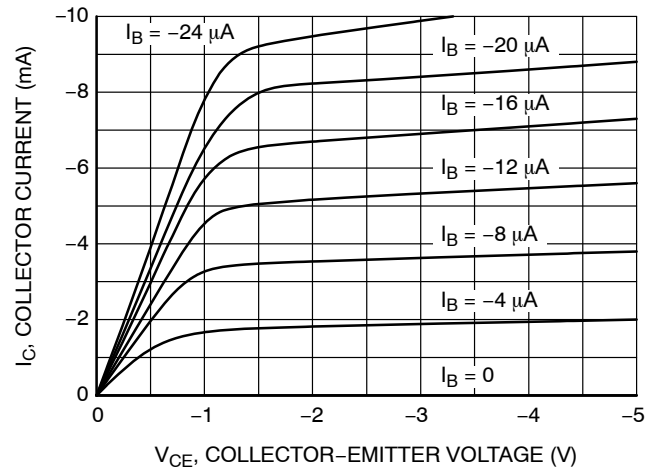


Figure 2. Static Characteristic

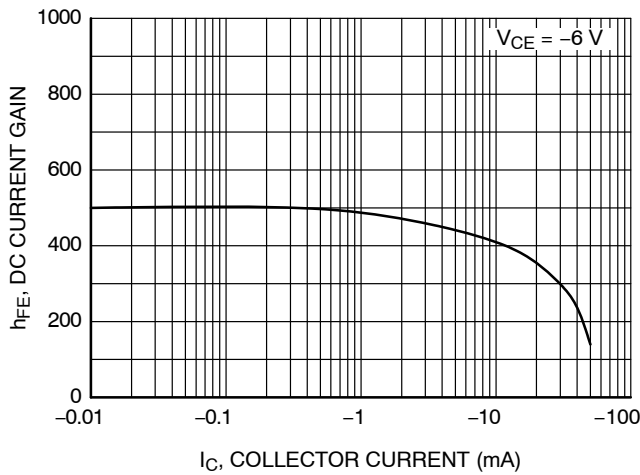


Figure 3. DC Current Gain

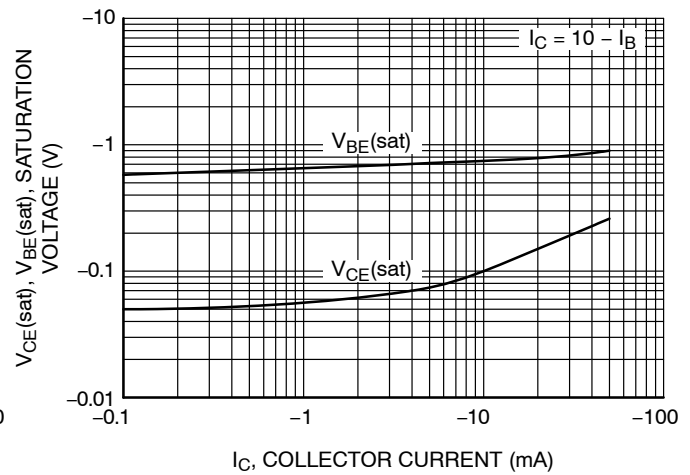


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

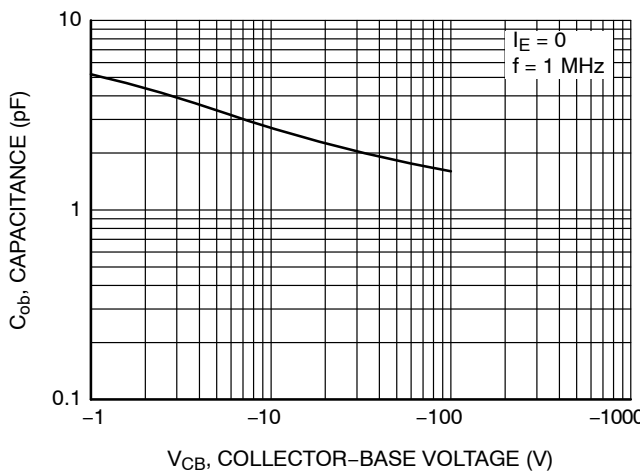


Figure 5. Collector Output Capacitance

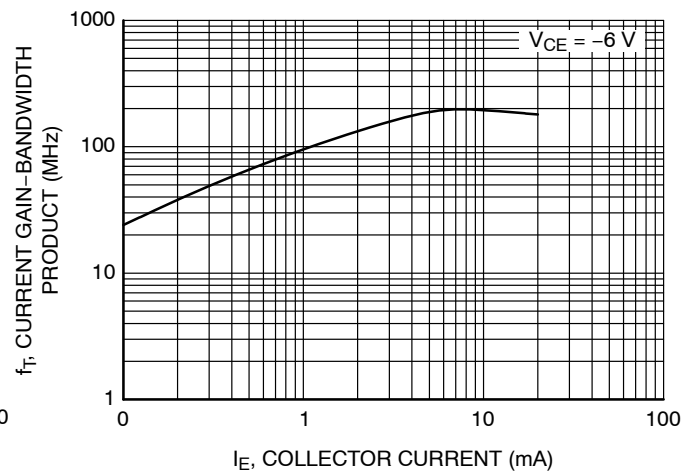
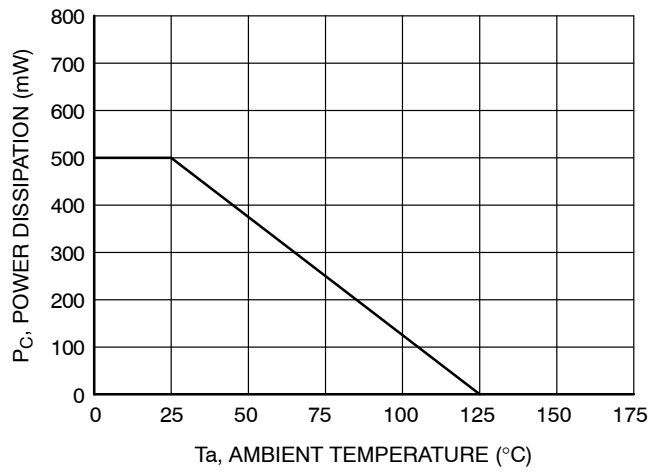


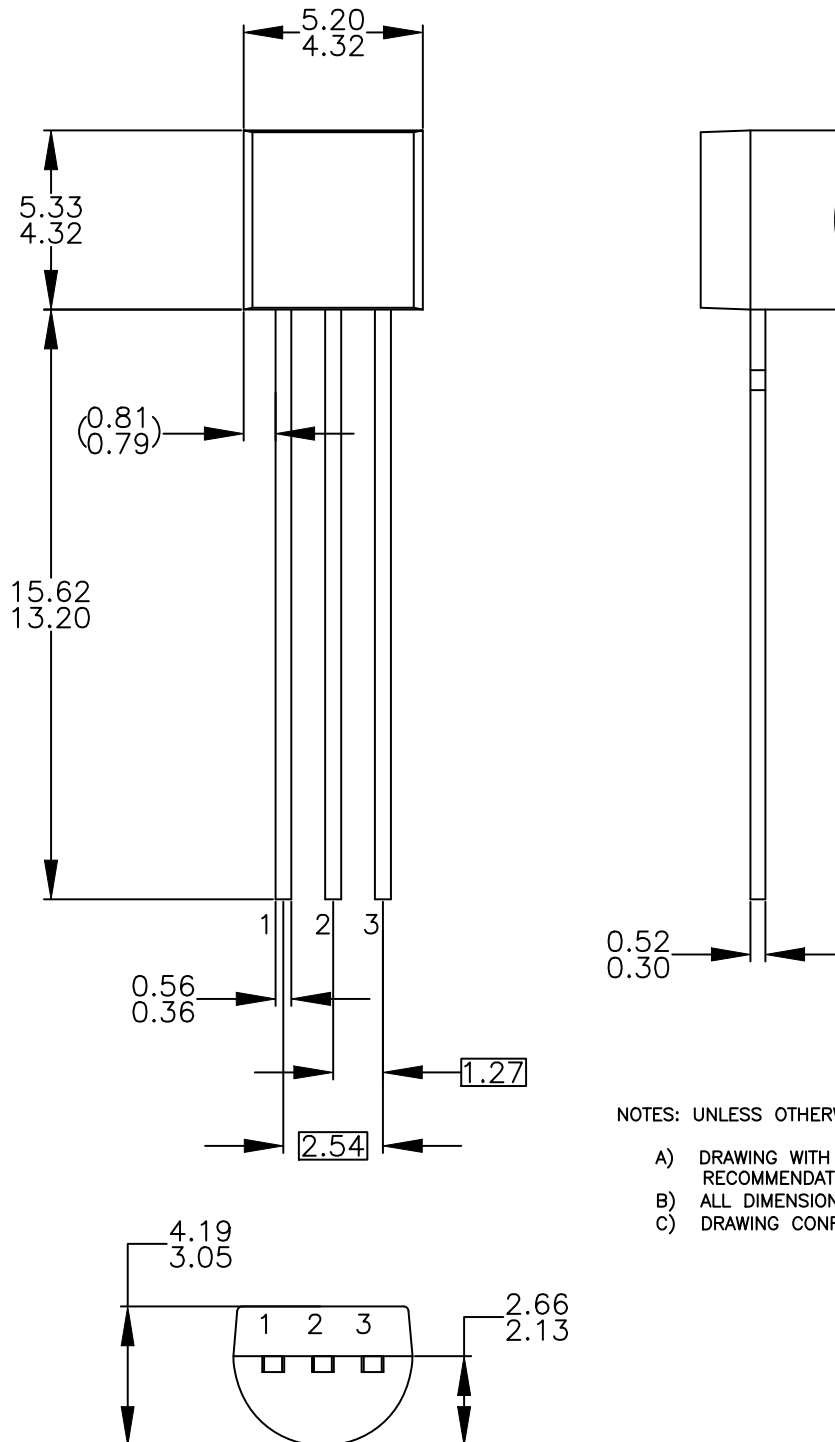
Figure 6. Current Gain Bandwidth Product

## TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

**Figure 7. Power Derating**

**TO-92 3 4.825x4.76**  
**CASE 135AN**  
**ISSUE O**

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

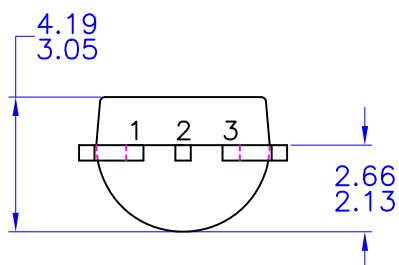
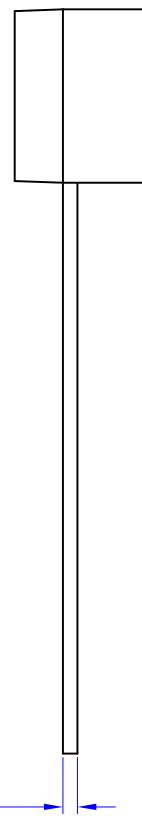
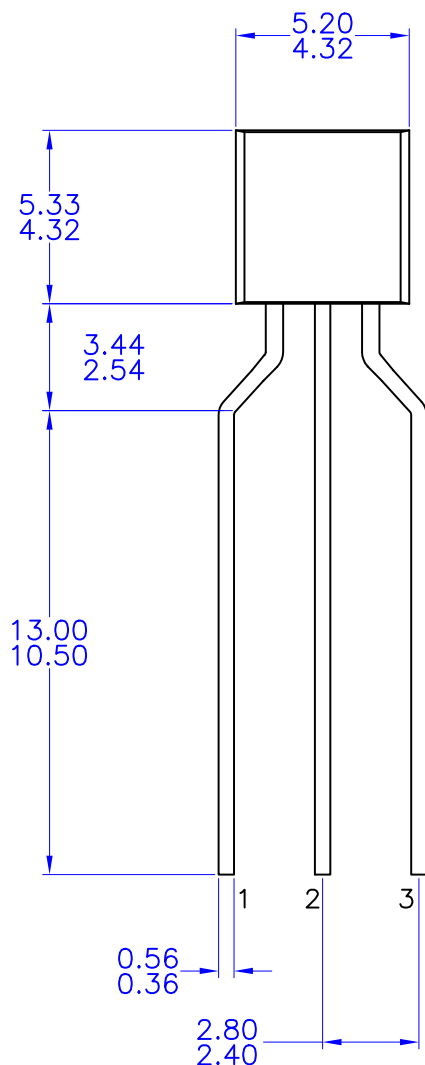
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CASE 135AR  
ISSUE O

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